CURRENT EDUCATIONAL LITERATURE

The Scientific Method with Children. By HENRY LINCOLN CLAPP. Popular Science Monthly, November, 1893.

The writer suggests that the influence of college professors, and of the teachers and students in scientific schools, may be injurious rather than otherwise to natural science work in elementary schools.

He charges the scientific "method" with "beginning to teach science with ultimate undecomposable elements (this certainly *sounds* like a grave charge), and building up step by step with complete sequences and fine inferences." The scientific method, he affirms, is markedly synthetic, while children's natural sequences are from wholes to parts, and essentially analytic, though he admits that children may learn some things synthetically.

Furthermore, no method is scientific which does not arouse the pupil's own activity and lead him to direct himself.

Reference is made to a difference of opinion among experts as to the child's "natural sequences" in the study of a plant, one preferring to present the flower first, another the leaf, while the writer himself believes that the child observes first the flower and fruit.

In a previous paragraph the writer stated that the child's "natural sequences" are from wholes to parts. On that basis we may ask why the whole plant may not be presented first to the child.

At present there is much uncertainty regarding the place to begin and the thing to do in elementary science work. Much experimenting has been done, the results of which may yet suggest a foundation for scientific work with children. In this connection, the scientific schools and the efforts of scientists are regarded as a hindrance rather than a help, since the work of the scientific schools has been arranged by adult minds for adult minds. The writer reminds us that natural sequences for the adult mind may be quite unnatural for the child; that the adult and the child approach the same subject from totally different standpoints.

Notwithstanding recent efforts to bring the science work in the elementary schools of Boston nearer to the children's standpoint, and notwithstanding the change of name from "elementary science" to the more unassuming "observation lessons," this work still remains in a most unsatisfactory condition, which condition has not been improved, to say the least, by the traditions and methods of the scientific schools.

Reference is made to what the writer (but surely no one else) calls the former scientific method of teaching reading, writing, spelling, arithmetic, etc., which method has given place to one more in accordance with the children's needs. From this is argued by analogy that the scientific method in natural science should give place to a method natural to the children.

We beg to state that the so-called methods in teaching the subjects mentioned above were abandoned precisely because they were not scientific, and hence did not meet the needs of the children.

The normal schools are next criticised adversely, being charged with an extreme formalism calculated to take the heart out of any work, and to deprive the child of the opportunity to exercise his original power.

Instruction by "question and answer" is mentioned as characteristic of both scientific and normal school, and is regarded as objectionable in both, as it amounts to the mere telling of disguised information.

Notwithstanding the woeful deficiencies of the scientific and the normal schools, the writer believes that the correlation of these two with the elementary school might give us a prospect of discovering the true scientific method of teaching children.

With our limited understanding of the writer's views we can not but think that the above proposition ought to seem to him like a case of the blind leading the blind.

Having given some occasion for discouragement, the writer closes his article with a very encouraging account of an elementary school of six hundred pupils, which seems to have escaped the deteriorating influence of the college, the scientific, and the normal school, and, after a manner all its own, is doing excellent work in elementary science. The work in observation, as well as in expression, (drawing, oral and written language) seems to be admirable. Indeed, all the conditions seem to be ideal. We are furthermore informed, that many schools in different parts of the country, are doing similar work, and that such schools are calculated to discover a scientific method, suited to the needs of the elementary schools.

In comment upon the foregoing article, we may say that there is little doubt but scientists, and school-men of the college, the scientific and the normal school will agree with the writer that the "natural sequences" of children are from wholes to parts and that a large part of children's stud y must be analytic. Indeed, we suspect that they would say that the "ultimate undecomposable elements" of any substance, or essence, are not found without a great deal of analysis, and that the "building up with complete sequences and fine inferences" is rather a work of reconstruction after analysis, than a synthesis previous to analysis. The human mind, whether mature or immature, finds analysis a necessity, and very soon becomes incapable of working if debarred from activity in this direction.

Without doubt, those people will also agree with the writer, that only that is scientific which is in accordance with Nature's law, and that failure in securing the best results in scientific work, in the schools of every grade, is due, not to the scientific, but to the unscientific character of the work.

The writer does not need to be reminded that crudity marks instruction in this country, whether in the university, the scientific, the normal, or the elementary school. Much is yet to be learned about scientific

study, and still more about scientific teaching. When such valuable "object lessons," as the one described by the writer, are presented, no one will be more eager to learn from it than the scientist, or the schoolman.

The writer pleads for the "presumption of brains" on the part of the children of school age. May we venture to plead for the same on the part of the experienced men, who are doing their utmost to improve the condition of the scientific and the normal school?

Margaret K. Smith

Normal School, Oswego, N. Y.

Physics Teaching in Schools. By W. B. CROFT, M. A., Winchester College, England. Educational Times, (London), October 1, 1893.

Our school is ruled by an Act of the Privy Council, by which, with a few exceptions, science is compulsory for all. In due proportion it must be reckoned for deciding promotion from form to form. Each form attends two hours weekly and has extra work, usually in the shape of numerical examples.

If a boy were to pass up the school, as he might do, between the ages of twelve and nineteen, he would learn: first year, geometrical drawing, botany, physical geography; second year, simple mechanics, graphics, heat, hydrostatics; third year, chemistry; fourth year, chemistry; fifth year, geology; sixth year, electricity; seventh year, acoustics, geometrical and physical optics.

In the lower classes, much mental training is derived from numerical problems, in addition to the awakening by experiment of the power of observation. In the sixth and seventh years' teaching in physics, my aim is partly different: boys who survive to this stage are of more than average power, and, being well provided with mental exercise in other ways, have no need for the discipline of lengthy physical measurements, nor would the majority find them interesting; but they have the capacity and interest to assimilate the ideas of modern science, and to have their imaginations roused by hearing of its progress; and there is none amongst us here who doubts the importance that such knowledge should form a part of every educated mind.

Our physical department consists of a lecture room and laboratory, each about thirty feet square. Sunlight can be sent through these as well as to a smaller dark room. There are, besides, a photographic dark room and a north room about fifteen feet square. The chemical rooms are somewhat similar.

I attach the highest importance to having abundant glass cases. The instruments should be set out in ample space, with brief descriptions of their author, date, and use, according to the best methods, which may be learnt from the various collections at South Kensington. There should be a meridian line on the floor, and the latitude, longitude, and height above the sea should be indicated. It is easy to collect from scientific journals, pictures of special interest to hang upon the walls. I have been

fortunate in finding portraits of most of those whose names are familiar in physics.* * * *

Mr. Croft favors not only exact quantitative work by the student, but also rude experimental demonstration of the leading phenomena by the teacher—the lecture system.

O. B. Rhodes

Child Study; the Basis of Exact Education. By G. STANLEY HALL, Forum, December, 1893.

The author divides the work that has been done in the study of children into four groups. The division is made on the basis of the age of the subjects studied:

A. Studies of the human embryo.

B. Studies of infancy.

C. Studies of school life.

D. Studies of school life.

The author passes over the first and second divisions, and gives special attention to the study of school life, which study consists largely of observations upon the physical conditions of children in the public schools, as indicated by weighing and measuring, together with tests of the organs of special sense. This work has been done on a somewhat extended scale in several of the large cities of the United States.

In the study of muscular control, more work seems to have been done in Europe than in this country.

In addition to the above, the author gives some account of the investigations that have been made with the end in view of determining the contents of children's minds. These investigations were begun in this country by Dr. Hall, himself, and are being carried on with an appearance of more or less success in different localities.

The article closes with suggestions regarding the importance of the study of adolescence. A proposition is made to carry this investigation into the later period of school life, and even into college life.

At present we are not quite clear as to the ultimate utility of the masses of material that are being collected. It is to be believed, however, that more accurate knowledge concerning the physical and psychical development of the children and growth of the country, must lead to a re-adjustment of pedagogical conditions, and to a sense of the necessity for a more thorough preparation of teachers for their work.

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